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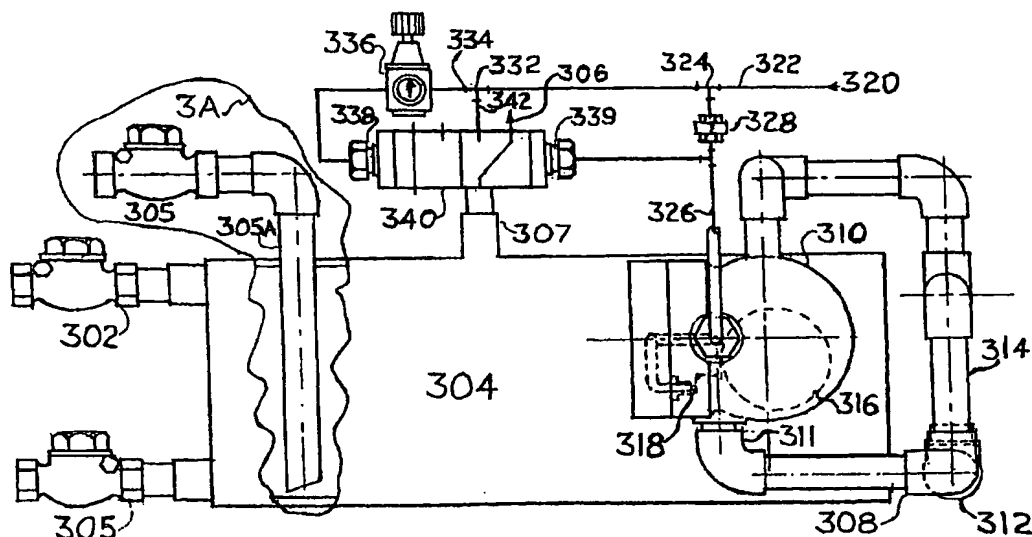
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[Continued on next page]

(54) Title: PUMP APPARATUS



(57) Abstract: Pumps for Steam Condensates and other Liquids, comprising receivers that may be connected firstly to the liquid source, and after filling are then pressurised to discharge the liquid to a transfer line, or to a vessel at a higher pressure than that of the source. The use of a small pilot valve to detect the liquid level, mounted externally to each receiver, and controlling the opening and closing of the pressurising and venting valves, enables an unusually low profile to be achieved.

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According to International Patent Classification (IPC) or to both national classification and IPC

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 F04F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data

### C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 321 017 A (GOTTLIEBSON MAYO)	1,2,4,5,
Y	23 March 1982 (1982-03-23)	7
A	abstract	3,9
	column 1, line 47 -column 2, line 53	
	figures	6,10
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X	DE 304 197 C (MICHAELIS F)	10,12
Y	3 December 1916 (1916-12-03)	
A	the whole document	1,7,9
	---	
X	FR 936 093 A (GRUNDER FRITZ)	10-12
Y	8 July 1948 (1948-07-08)	
A	page 2, line 57 -page 4, line 7	3,9
	figures 1-3	1,2
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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- \*&<sup>1</sup> document member of the same patent family

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# INTERNATIONAL SEARCH REPORT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 1 628 608 A (NEWHOUSE RAY C) 10 May 1927 (1927-05-10)	10-12
A	page 1, line 75 -page 3, line 88 figures	1,2,7,9
X	US 474 338 A (DYER I T) 3 May 1892 (1892-05-03)	10-12
A	page 1, line 18 -page 3, line 9 figures	1,2,7,9

# INTERNATIONAL SEARCH REPORT

Information on patent family members

PCT/GB 03/02276

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4321017	A	23-03-1982	NONE	
DE 304197	C		NONE	
FR 936093	A	08-07-1948	NONE	
US 1628608	A	10-05-1927	NONE	
US 474338	A		NONE	